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10/650,504

08/27/2003

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EXAMINER

ALANKO, ANITA KAREN

ART UNIT

PAPER NUMBER

1765

MAIL DATE

DELIVERY MODE

06/26/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/650,504

Applicant(s)

INOMATA ET AL

Examiner

Anita K. Alanko

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13, 14, 20, 21 and 24-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13, 14, 20, 21 and 24-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>4/12/07</u> . | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marciniec (US 3,982,976) in view of Cain (US 5,503,881).

Marciniec discloses a method comprising:

placing a silicon substrate (capable of being used as a solar cell) on an electrode inside a chamber (col.4, lines 13-15); and

forming textures on a surface of the substrate by using residues as an etching mask (col.4, lines 41-46).

Marciniec fails to disclose a chamber with a plate.

Cain teaches a dry etching method comprising:

placing a substrate 96 to be etched inside a chamber (Fig.3B, col.3, lines 54-65); and
covering said substrate to be etched with a plate 92 provided with a number of opening portions ("apertures" in bottom surface 94),

wherein a distance between a surface opposing said substrate to be etched and said substrate to be etched in a peripheral portion (db' and db''') is set shorter (col.3, line 62) than a distance between the surface opposing said substrate to be etched and said substrate to be etched in a central portion of said plate (db'').

The advantage of using a plate as taught by Cain is that it improves process uniformity (col.2, lines 1-2).

It would have been obvious to use a plate as taught by Cain in the method of Marciniac because Cain teaches that it improves process uniformity.

The modified method of Marciniac inherently forms textures by residues composed of substrate material (silicon) since by-products are trapped by the plate and form on the substrate to at least some degree, contributing to surface texturing as cited.

Claims 20-21 and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marciniac (US 3,982,976) in view of Nishibayashi et al (US 5,417,798) or Gut (US 4,810,322).

Marciniac discloses a method comprising:

placing a silicon substrate (capable of being used as a solar cell) on an electrode inside a chamber (col.4, lines 13-15); and

forming textures on a surface of the substrate by using residues as an etching mask (col.4, lines 41-46).

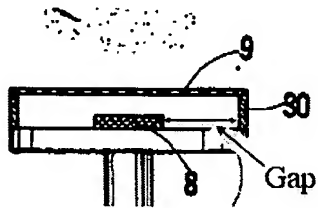
Marciniac fails to disclose a chamber with a plate with a protruding wall.

Nishibayashi discloses a dry etching method comprising:

placing a substrate 8 to be etched inside a chamber 1 (Fig.5); and

covering said substrate to be etched with a plate 9 provided with a number of opening portions (col.5, lines 20-21),

wherein a protruding wall 30 is provided to said plate on a surface opposing said substrate to be etched and said protruding wall is separated from a nearest surface of said substrate by a gap (see below, excerpt from Fig.5).



Nishibayashi teaches that an advantage of using the plate with a protruding wall is that it enables the control of the energies or momenta of ions (col.2, lines 35-37).

Gut teaches a method comprising:

placing a substrate 22 to be etched on an electrode 16 inside a chamber 12 (Fig.1);

coering said substrate to be etched with a plate (shown in Fig.2) provided with a number of openings 32, 34; wherein a protruding wall ("protrusion" col.4, lines 46-47) is provided to said plate on a surface opposing said substrate to be etched and said protruding wall is separated from a nearest surface of said substrate by a space (inherent since it extends form the plate 30 toward the bottom plate). Gut teaches that the advantage of using a protrusion is that it enables etch rate uniformity (col.4, line 55)

It would have been obvious to use a plate as taught by Nishibayashi or Gut in the method of Marciniec because Nishibayashi teaches that it enables the control of the energies or momenta of ions or Gut teaches that it enables etch rate uniformity.

The modified method of Marciniec inherently forms textures by residues composed of substrate material (silicon) since by-products are trapped by the plate and form on the substrate to at least some degree, contributing to surface texturing as cited.

Allowable Subject Matter

Claim 24 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to teach or suggest a method for producing a solar cell wherein said plate has a shorter distance in the peripheral portion than in a central portion and is provided with a protruding wall on a surface thereof opposing said substrate and said protruding wall is separated from a nearest surface thereof opposing said substrate and said protruding wall is separated from a nearest surface of said substrate by a space, as in the context of claim 24.

The closest prior art, Cain and Nishibayashi, discloses the separate elements of claim 24, but there is no motivation to combine them, as in the context of claim 24.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting

ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 13-14, 20-21, 24-26 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims of copending Application No. 10/650,505 and 10/648,429. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instant claims encompass the claimed subject matter of texturing a substrate for a solar cell using a plate.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Amendment

The objection to the specification is withdrawn and the 112 rejection is withdrawn in view of the claim amendments deleting the noted claim language. The 102 rejections over Cain, Nishibayashi and Gut are withdrawn. These references do not explicitly teach forming a texture by using residues chiefly composed of components of the substrate as an etching mask. However Marciniec is newly cited to teach that it is known to use residues as etch masks, as discussed above in the rejections.

The claims are also rejected under obvious-type double patenting over 10/650,505 and 10/648,429.

Response to Arguments

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

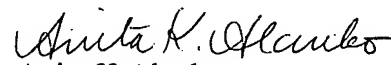
Applicant argues about the protruding wall securing a space, however this argument is not commensurate in scope with the claim language. Arguments about covering a space are not persuasive since the plate is overlying, and therefore in a covering relationship.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anita K. Alanko whose telephone number is 571-272-1458. The examiner can normally be reached on Mon-Fri until 2:30 pm (Wed until 11:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Anita K Alanko

Primary Examiner

Art Unit: 1765

Art Unit 1765